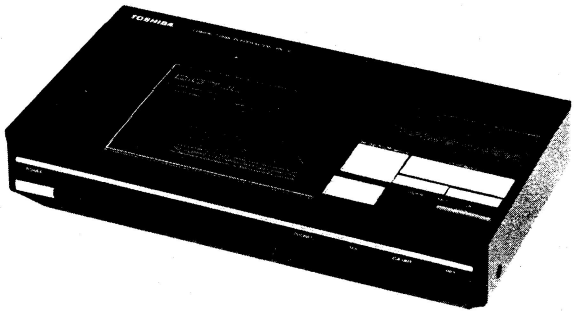
SERVICE DATA
FILE NO. 170-235

TOSHIBA

COMPACT DISC DIGITAL AUDIO PLAYER

XR-J9



SPECIFICATIONS

Type:	Compact Disc player with optical pickup
No. of channels:	2 (stereo)
Frequency response:	5 Hz – 20 kHz, +0.5 dB –1.5 dB
Dynamic range:	84 dB
Total harmonic distortion:	0.01% (1 kHz)
Channel separation:	75 dB (1 kHz)
Wow and flutter:	Unmeasurable
Output level:	Line out: 1.0V Phones: 0.6V (32 ohms)
Pickup:	Semiconductor laser
Random access:	By track number
Power supply:	AC 120V, 60 Hz (U.S.A. and Canada) AC 220V, 50 Hz (Europe) AC 240V, 50 Hz (U.K. and Australia) AC 110 – 127/220 – 240V, 50/60 Hz (Others)
Power consumption:	7W
Dimensions:	252(W) x 50(H) x 130(D) mm
Weight:	1.3 kg

Specifications are subject to change without notice.

TA, TC, TE, TU, AY, VF
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CAUTION: Before returning the unit to the customer, check that the resistance between both blades of AC plug and any accessible metal parts is more than 3MΩ after completion of servicing, using the circuit tester. (U.S.A. Model only)

1. OPERATING CONTROLS

Top

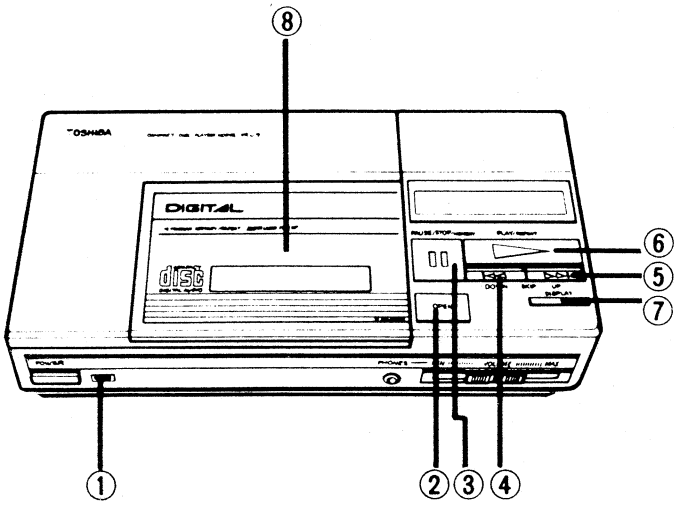


Figure 1

Bottom

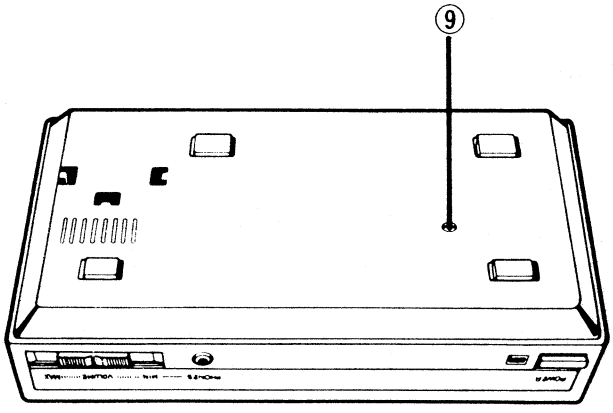


Figure 2

Top

① Power Indicator (POWER)
This indicator lights when power is on.

② Open Key (OPEN)
Press to open the disc cover.

③ Pause/Stop/Memory Key (PAUSE/STOP/MEMORY)
Press to briefly interrupt disc play. Press again to switch to the stop mode (display returns to 00 00:00 and the disc stops spinning). When in the stop mode, this key becomes the memory key.

④ Down Skip Key (⏮DOWN SKIP)
Press during disc play to return to the beginning of the current track. Hold down to continuously move backward to the beginning of each previous track.
If this key is pressed during memory disc play, the pickup moves back to the beginning of each track in the memory in order.
If this key is pressed while the PLAY/REPEAT key is held down, the fast reverse mode is activated.

⑤ Up Skip Key (⏭UP SKIP)
Press during disc play to advance to the beginning of the next track. Hold down to continuously move forward to the beginning of each track.

If this key is pressed during memory disc play, the pickup moves ahead to the beginning of each track in the memory in order.
If this key is pressed while the PLAY/REPEAT key is held down, the fast forward mode is activated.

⑥ Play/Repeat Key (PLAY/REPEAT)
Press to begin disc play.
If this key is pressed once during disc play, the entire disc is played repeatedly. If this key is pressed a second time, the repeat mode is cancelled.

⑦ Display Key (DISPLAY)
Use this key to switch between the following three display modes.
(1) Current track no. – Elapsed track playing time
(2) Remaining no. of tracks – Remaining disc playing time
(3) Programmed track no. – Program step no.

Note: Display mode 2 is not possible during memory disc play and display mode 3 is possible only during memory disc play.

⑧ Disc Cover

Bottom

⑨ Pickup Locking Screw

Front

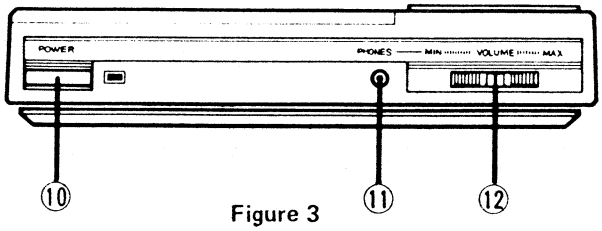


Figure 3

Rear

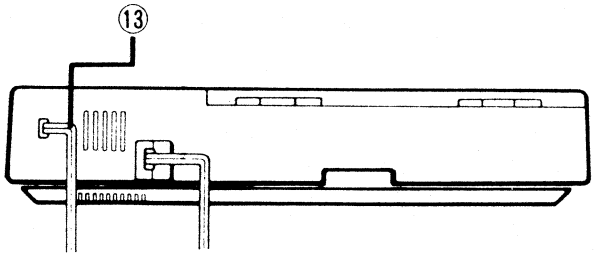


Figure 4

Front

⑩ Power Switch (POWER)
Use to switch power on and off. When power is switched on, the display reads 00 --:--.

⑪ Headphones Jack (PHONES)
Connect headphones (not supplied with this player) having a 3.5mm plug to this jack.

⑫ Volume Control (VOL)
Volume control for the headphones connected to the headphones jack.

Rear

⑬ Line Out Cable
This cable is used when connecting this player to an amplifier.

Display Panel

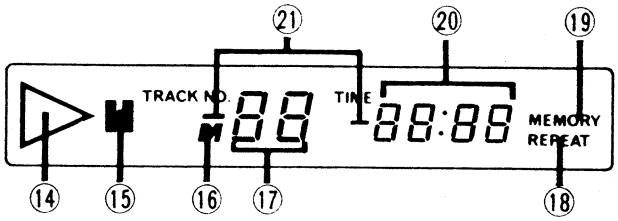


Figure 5

Display Panel

⑭ Play Indicator (▷)
Lights when a disc is being played.

⑮ Pause Indicator (▮▮)
Flashes on and off when the pause mode is activated.

⑯ Memory Indicator (M)
Lights during memory disc play.

⑰ Track No. Indicator (TRACK NO.)
Shows either the number of the track currently being played or the remaining number of tracks on the disc.

⑱ Repeat Indicator (REPEAT)
Lights during repeat disc play.

⑲ Memory Indicator (MEMORY)
Flashes on and off while a memory play sequence is being entered or read out and remains lit when memory input has been completed and during memory disc play.

⑳ Time Indicator (TIME)
Shows either the elapsed track playing time or remaining disc playing time. When entering or checking memory contents, this indicator shows the memory program step number.

㉑ Display Mode Indicator (–)
Lights when the display key is pressed to switch to the remaining no. of tracks/remaining disc playing time display mode.

2. DISASSEMBLY INSTRUCTIONS

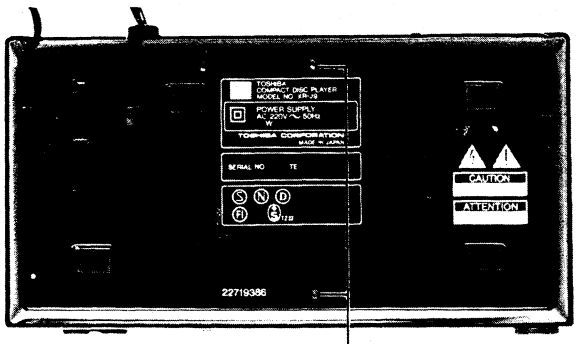
BOTTOM PLATE REMOVAL

1. Remove two screws Ⓐ from bottom plate and four screws Ⓑ from cabinet side boards, and the bottom plate will be removed.

Side

Ⓑ φ2.6 x 6mm

Figure 7



Bottom

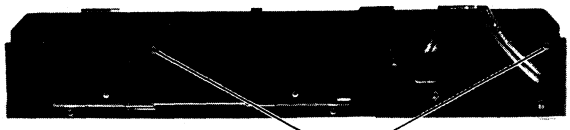
Ⓐ φ2.6 x 8mm

Figure 6

Ⓑ

φ2.6 x 6mm

Figure 8



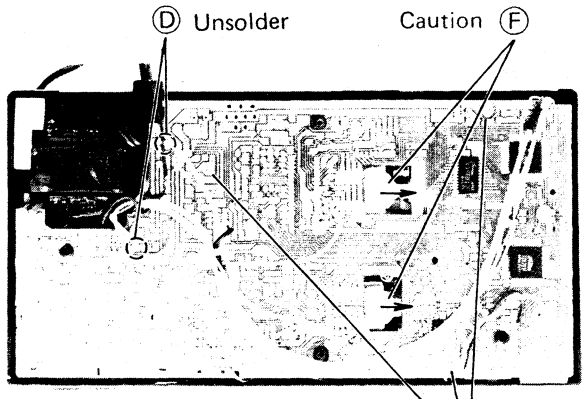
Top

Ⓑ φ2.6 x 6mm

Figure 9

MAIN P.C. BOARD ASSEMBLY REMOVAL

1. Remove three screws Ⓒ from the P.C. Board and five unsolder wire leads Ⓓ of power transformer.
2. Move flexible P.C. Boards connectors to right outside Ⓔ and remove two flexible P.C. Boards Ⓕ from mechanism assembly.
3. Since the phone jack and knobs protrude slightly from cabinet, first raise and pull opposite end of the P.C. Board on which the phone jack is mounted, and the P.C. Board will be removed.
4. Remove one screw Ⓖ from LED diode mounting strap.
5. Remove one pin cord mounting screw Ⓗ and remove cord bush and power transformer.



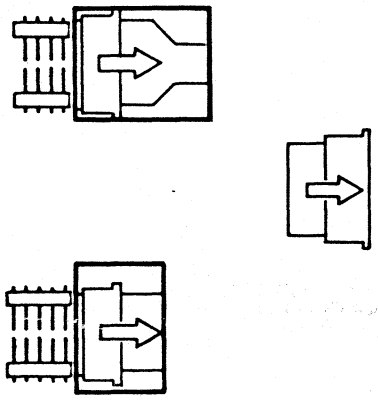
Ⓓ Unsolder

Caution Ⓕ

Ⓒ φ2.6 x 8mm

Figure 10

CAUTION: Before removing main P.C. Board, do not forget to remove two flexible P.C. Boards from mechanism assembly.



Move white connector to the direction indicated by arrow and pull the flexible P.C. Boards forward, and then the flexible P.C. Board will be removed.

Figure 11

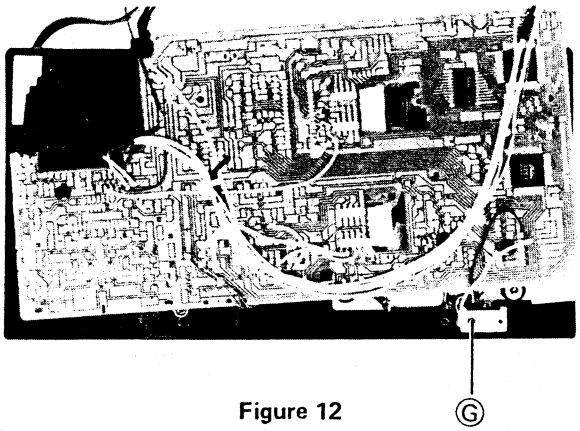


Figure 12

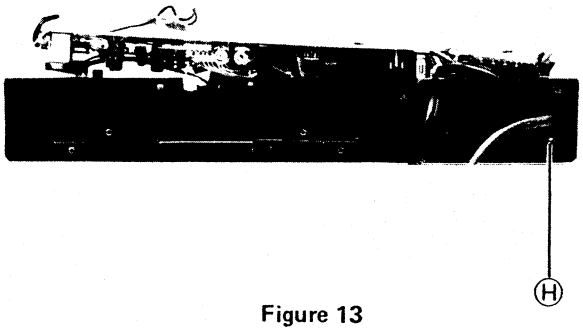
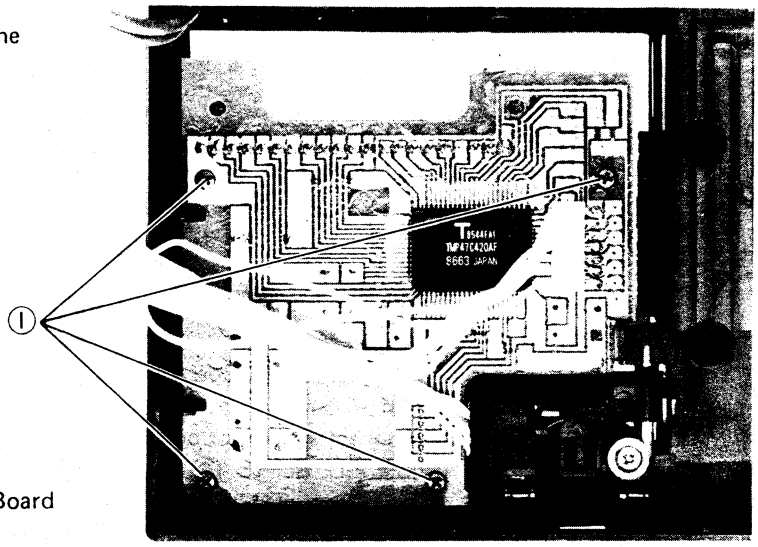


Figure 13

DISPLAY P.C. BOARD REMOVAL

1. Remove four P.C. Board mounting screws (I), and the display P.C. Board will be removed.



Control P.C. Board

Figure 14

MECHANISM ASSEMBLY REMOVAL

1. Remove Main P.C. Board, power transformer, and power cord bush.
2. Remove four mechanism mounting screws (J), and the mechanism assembly will be removed.

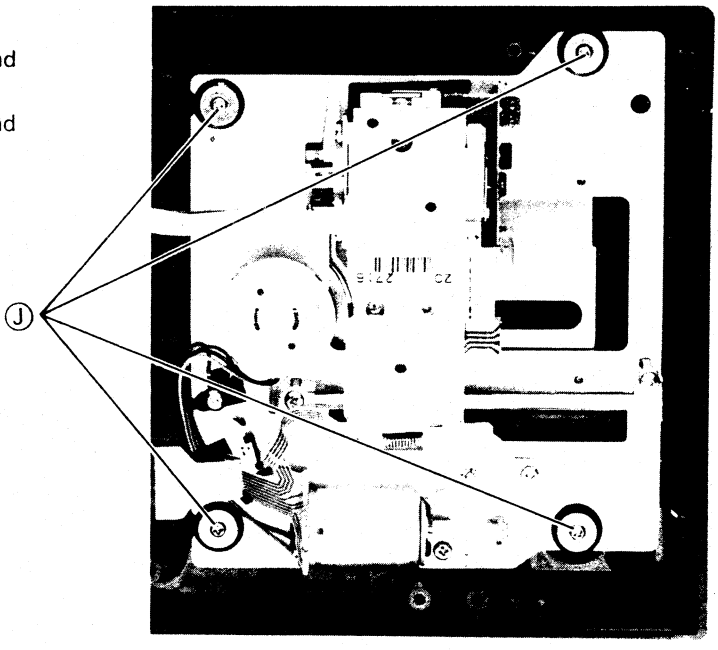


Figure 15

3. BLOCK DIAGRAM

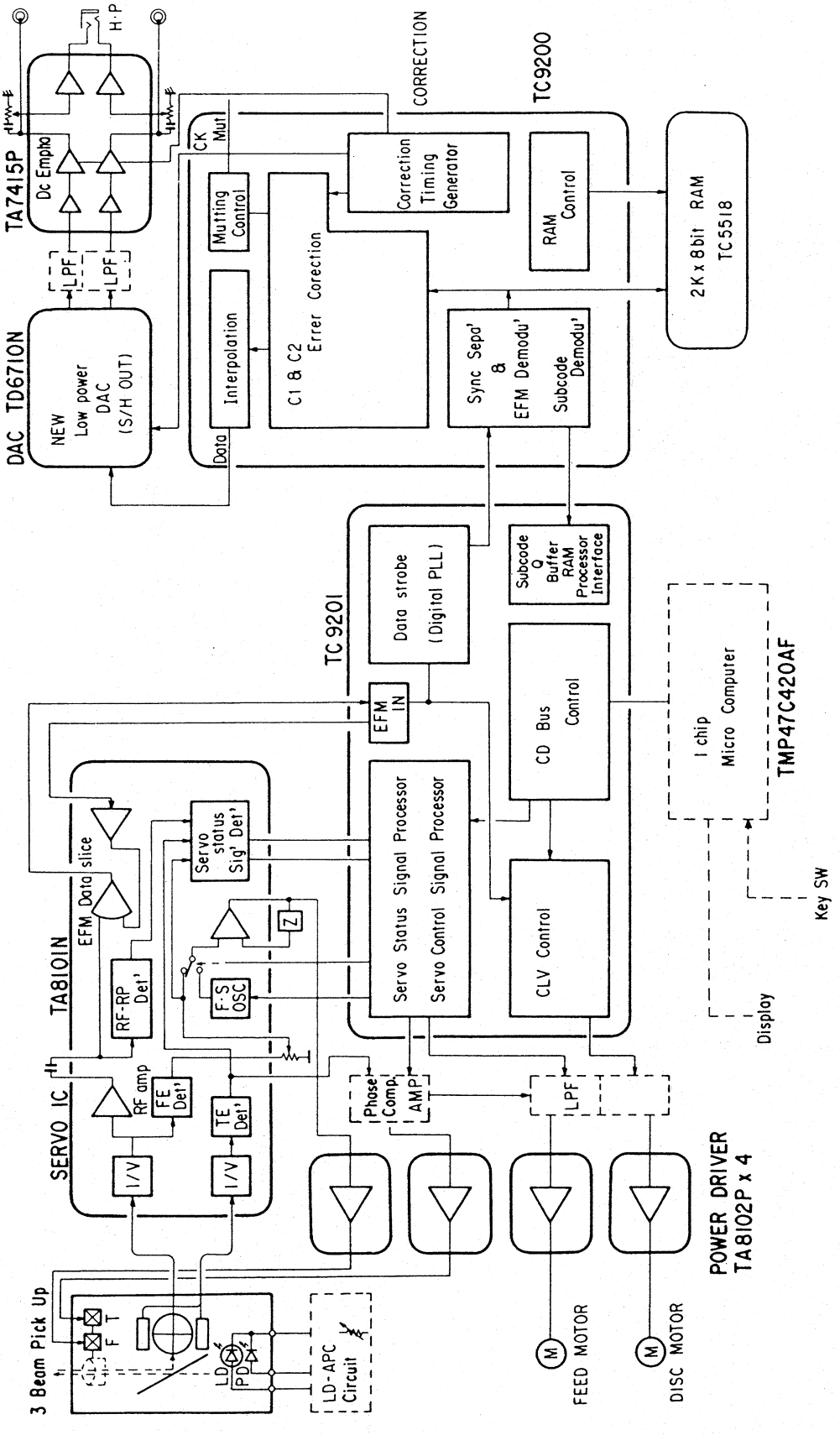


Figure 16

4. ADJUSTMENT INSTRUCTIONS

PICKUP REPLACEMENT AND ADJUSTMENTS

1. PICKUP REPLACEMENT

Caution on Replacement:
A laser diode mounted inside a pickup is very susceptible to external static electricity. Though it will operate right after replacement, it may be subject to bad offection during replacement or its life may be shortened. When replacing, use conductive gum mat, soldering iron with ground wire, etc. to protect the laser diode from damage by static electricity.

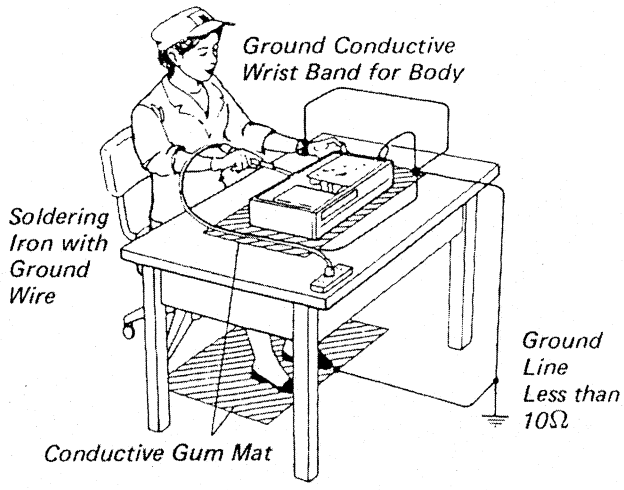


Figure 17

1. Remove cabinet bottom plate referring to Disassembly Instructions.

2. Remove gear A and B assembly shown in Figure 18 by removing one washer.

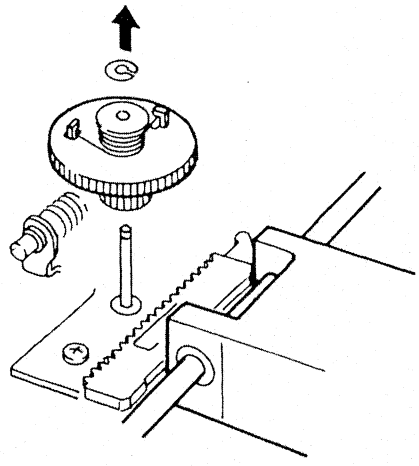


Figure 18

3. Remove two screws fixing guide shaft and unsolder Main P.C. Board side of Flexible P.C. Board attached to pickup.
   When replacing pickup and Flexible P.C. Board mounted to pickup motor, remove two screws fixing pickup motor.

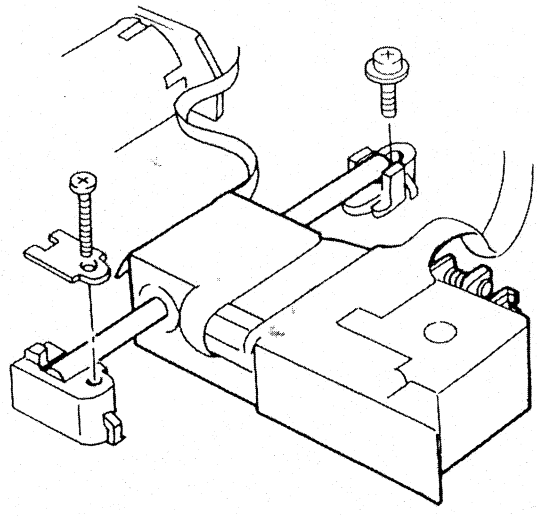


Figure 19

4. Insert shorting pin, which is one of repair parts, into pickup to be removed. (Figure 20)

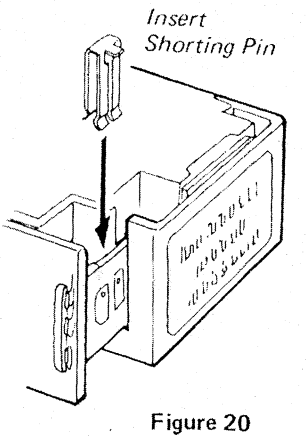


Figure 20

5. Lift up guide shaft side of the pickup slightly and position pickup height adjusting lever to mechanism chassis cutout. Then remove the guide lever by pulling it in the guide shaft side. (Refer to Figure 21)

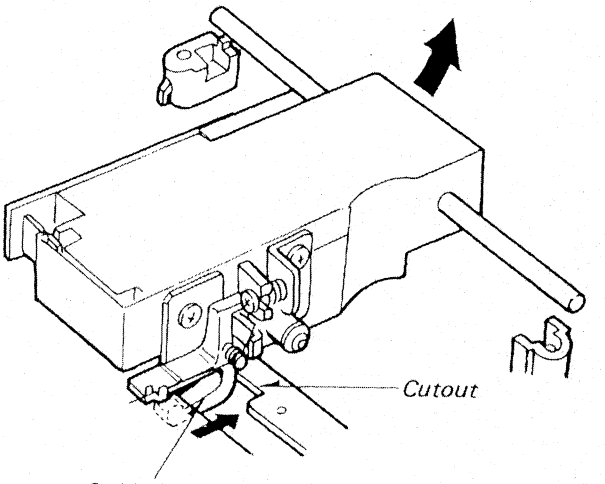


Figure 21

6. Desolder terminals of the APC P.C. Board (fixed with double sided adhesive tape) and remove the P.C. Board. (Figure 22)

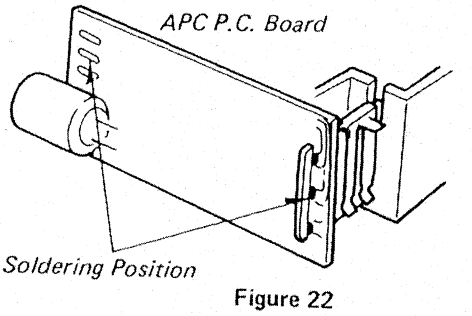


Figure 22

7. Remove rack gear by removing two screws fixing it. (Figure 23)

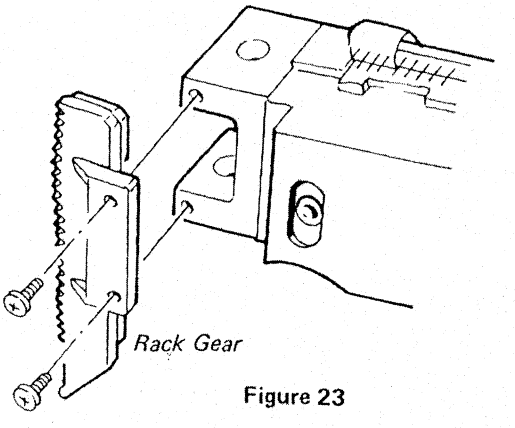


Figure 23

8. Remove pickup adjustment lever by removing two screws fixing it. (Figure 24)
9. Assemble pickup up to the steps required for laser power coarse adjustment.
   1) Assemble pickup adjustment lever, rack gear, APC P.C. Board, and Flexible P.C. Board of APC P.C. Board. After assemblying APC P.C. Board, remove shorting pin.
   2) After laser power adjustment is completed, install the pickup on mechanism.

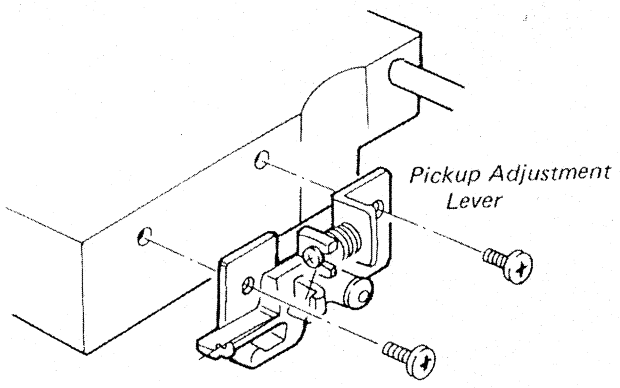
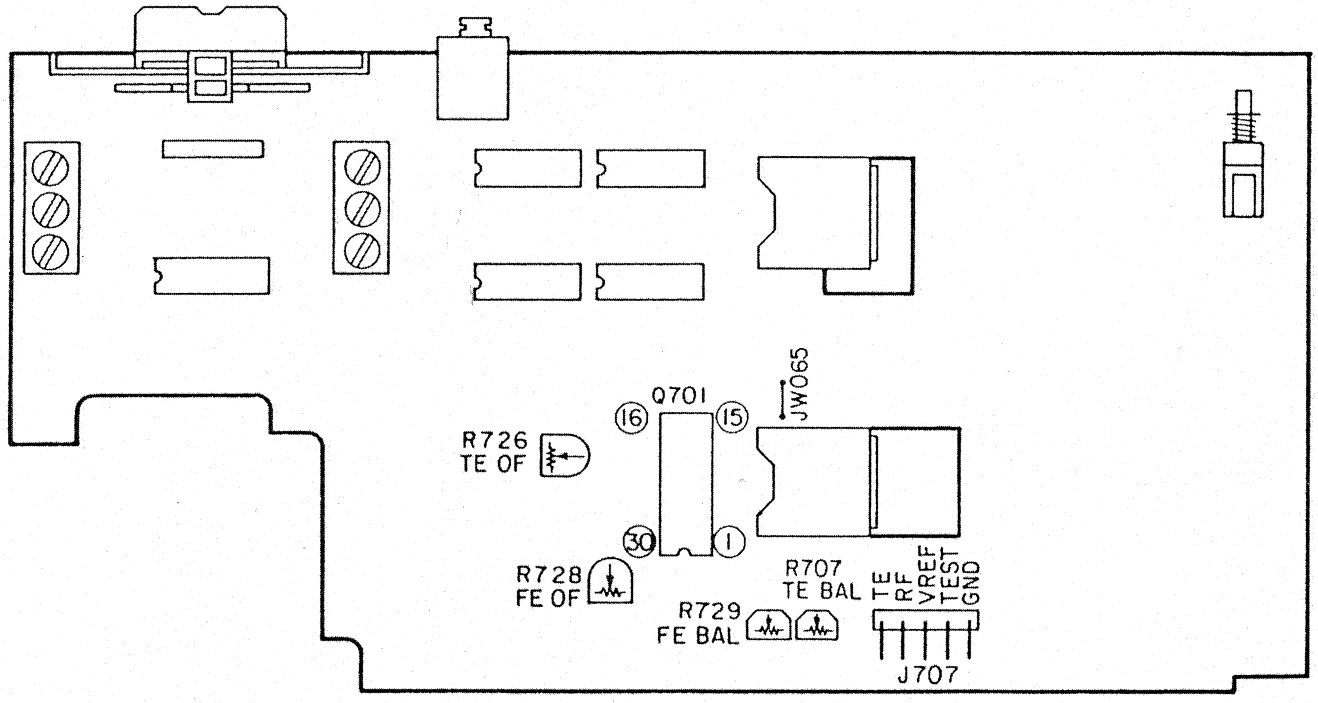


Figure 24

2. ADJUSTMENT PROCEDURE

Adjustment Locations



Main P.C. Board

Figure 25

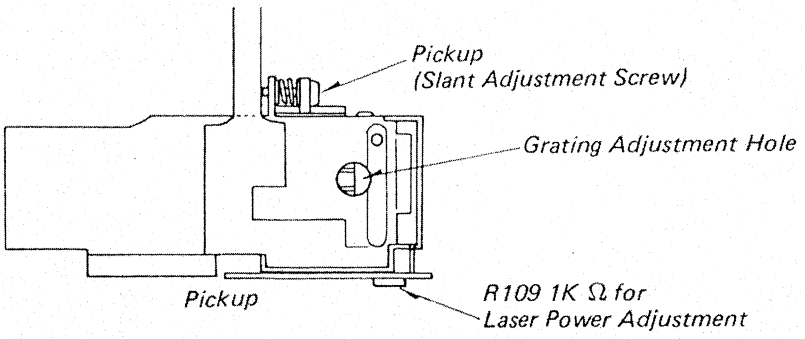


Figure 26

1 LASER POWER COARSE ADJUSTMENT

(Perform following adjustment before installing pickup to mechanism.)

1. **Note:** R109 1K ohm laser power adjustment VR on APC P.C. Board should not be turned before the adjustment is completed.
   Note: Shorting pin should be removed from pickup.
2. Set unit to ON
   Cut JW065.
   Set close limit switch to ON. (Push the switch or short-circuit on the P.C. Board.)
   Adjust R109 APC adjustment VR on APC P.C. Board so that meter indicates 150μW with laser power meter sensor applied to pickup lens. (Figures 27 to 29)

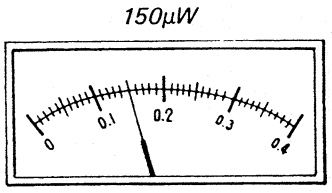


Figure 27

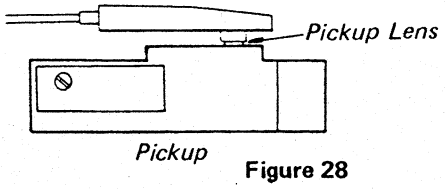


Figure 28

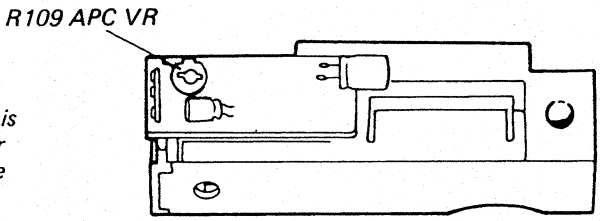
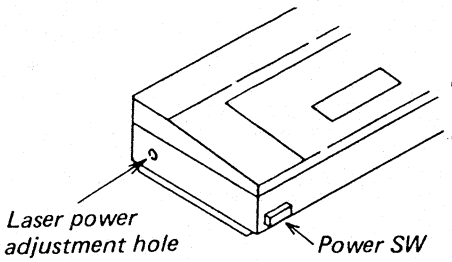
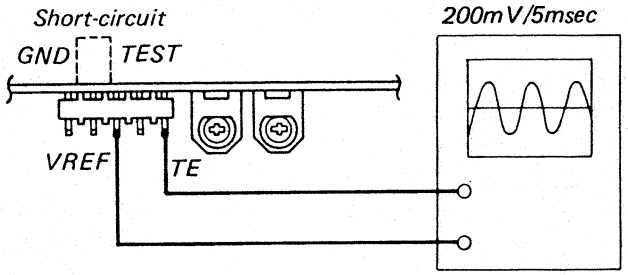


Figure 29


When the adjustment is completed, set jumper wire and switch to the original condition.
Laser power adjustment hole
Power SW

2 TRACKING ERROR BALANCE COARSE ADJUSTMENT

1. Connect oscilloscope to pins "VREF" and "TE" of J707. (Figure 30)
2. Set test disc YEDS-7 to PLAY mode.
3. Tracking error waveform can be seen when "TEST" and "GND" of J707 are short-circuited at PLAY mode.
4. Adjust R707 100K ohm TE BAL VR so that tracking error signal waveform obtains ±10mV with UP key pushed. (Figure 31)
   Once UP key is pushed, it allows operation for about 20 seconds. If the operation stops, push the UP key again.



Directly ground the GND terminal of the prove.

Figure 30

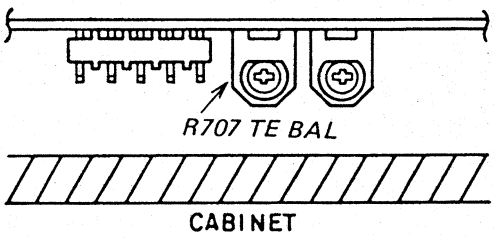
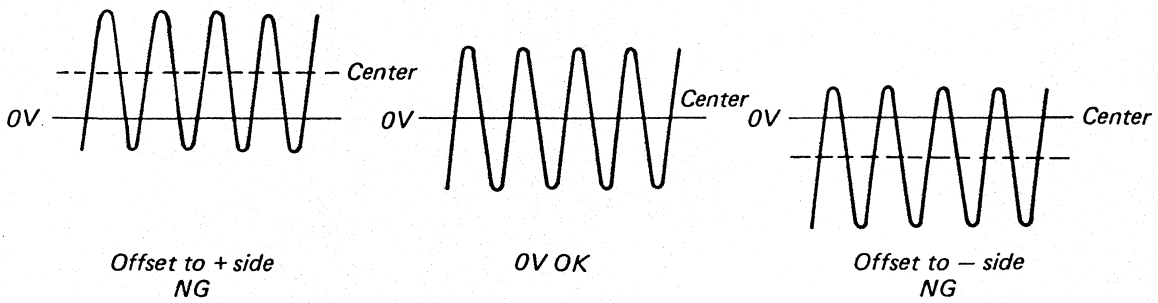


Figure 31



Offset to + side NG | *0V OK* | *Offset to − side NG*

Figure 32

3 PICKUP SLANT ADJUSTMENT

1. Connect oscilloscope to pins "VREF" and "RF" of J707. (Figure 33)
2. Set test disc YEDS-7 to play mode.
3. Adjust pickup slant adjustment screw so that center part of RF signal (eye pattern) is clear.
4. When the adjustment is completed, apply screw lock to the slant adjustment screw. (Figure 34)

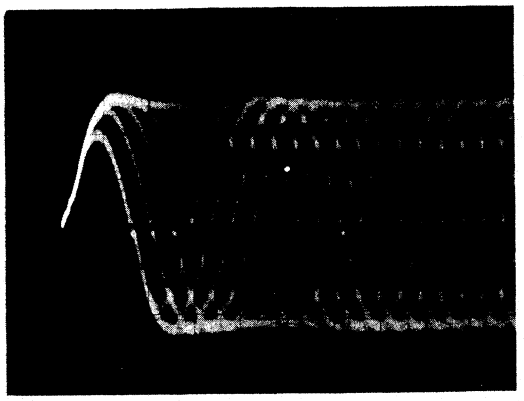


Photo 1 RF Signal (Eye Pattern)

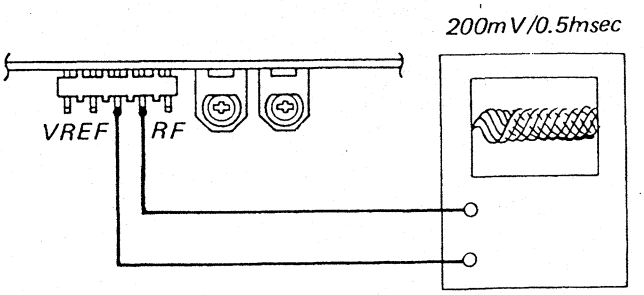


Figure 33

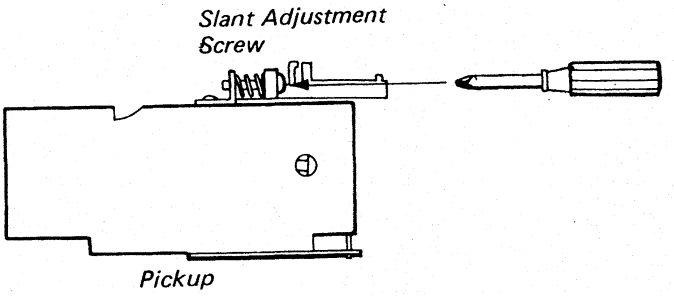


Figure 34

4 PICKUP DIFFRACTION GRATING ADJUSTMENT

1. Connect oscilloscope to pins "VREF" and "TE" of J707. (Figure 35)
2. Search 12 pieces of test disc YEDS-7.
3. Tracking error waveform can be seen when "TEST" and "GND" of J707 are short-circuited at PLAY mode.
4. Insert eccentric adjustment driver into grating adjustment hole and turn the driver carefully (slowly) until tracking error waveform (TE level) reaches max. amplitude.
5. Search track No. 1 and check that level difference to track No. 12 is within 10%.

Note: When turning the eccentric adjustment driver, observe the blade mounted on the drive as a reference. The rotating angle is very fine, like an angle of a razor blade.

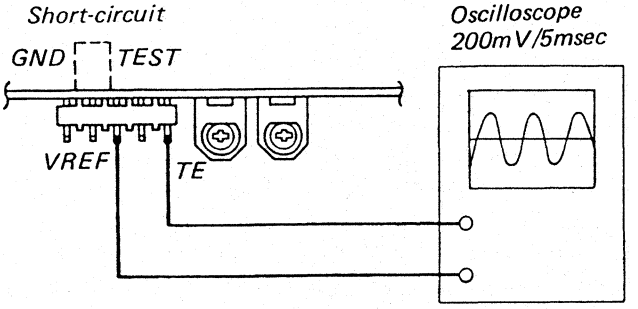


Figure 35

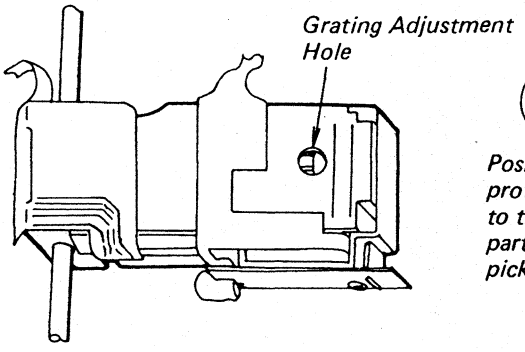


Figure 36

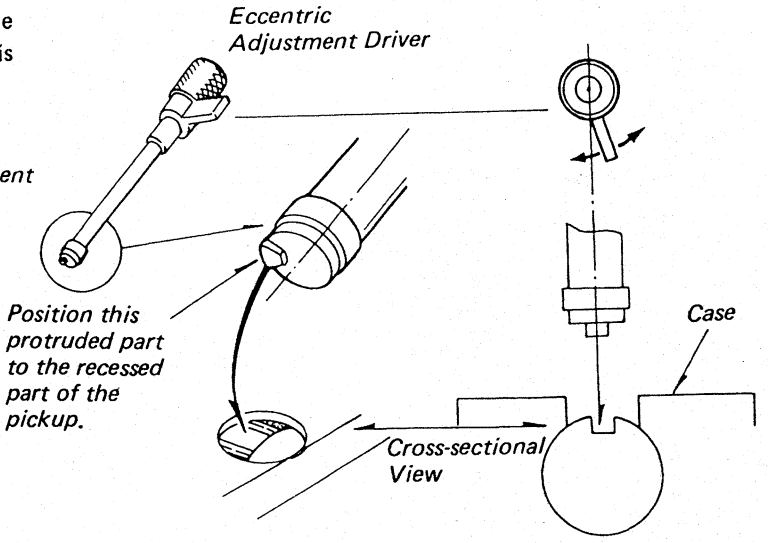

Eccentric Adjustment Driver
Position this protruded part to the recessed part of the pickup.
Case
Cross-sectional View

Figure 37

5 FOCUS ERROR BALANCE ADJUSTMENT

1. Connect oscilloscope to pins "VREF" and "RF" of J707. (Figure 38)
2. Adjust R729 focus error balance VR so that RF signal (eye pattern) is clear with test disc YEDS-7 played back.
   Refer to photo of pickup slant adjustment for waveform. (Figure 39, Photo 1)

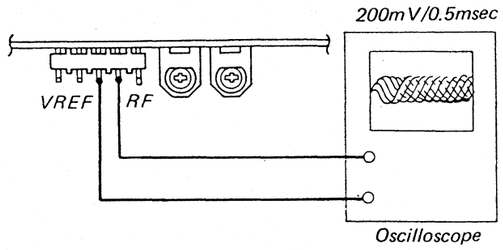


Figure 38

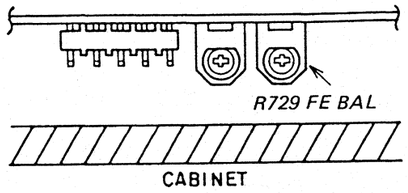


Figure 39

6 APC VR (LASER POWER FINE ADJUSTMENT)

1. Connect oscilloscope to pins "VREF" and "RF" of J707. (Figure 40)
2. Play back test disc YEDS-7.
3. Adjust R109 APC VR so that RF signal obtains 1Vp-p. (Photo 1)

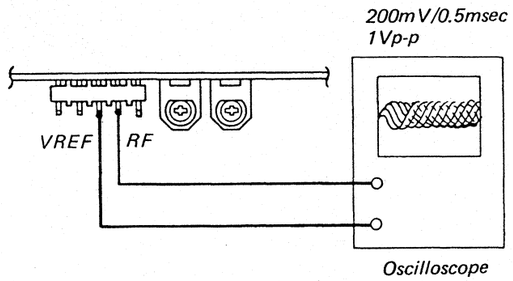
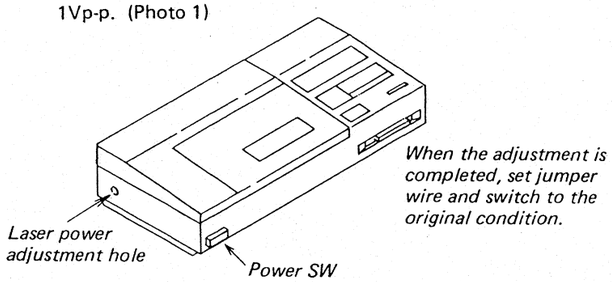


Figure 40


When the adjustment is completed, set jumper wire and switch to the original condition.
Laser power adjustment hole
Power SW

7 TRACKING ERROR BALANCE FINE ADJUSTMENT

1. Proceed adjustment of item 2 Tracking error balance adjustment again.

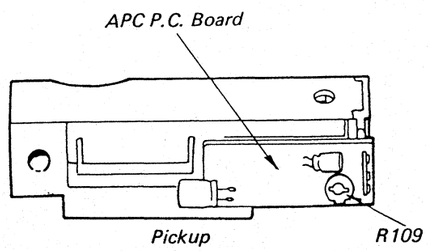


Figure 41

8 THE OTHER ADJUSTMENT

(Tracking and focus error offset adjustment)
This adjustment is proceeded mainly when Q701 SERVO IC is replaced. This adjustment is not needed in pickup replacement. Check after adjustment of item 1 is completed.

* Check after pickup is assembled completely.

1. Connect oscilloscope to Q701 SERVO IC. (Figure 42)
   For tracking error offset adjustment and check: pin #22
   For focus error offset adjustment and check: pin #28
2. Connect filter circuit shown in Figure 42 across Q701 and oscilloscope.
3. Adjust each R726, R728 so that 0V ±10mV is obtained with power of unit set to ON.
   Note: Perform adjustment with the mechanism flexible P.C. Board removed.

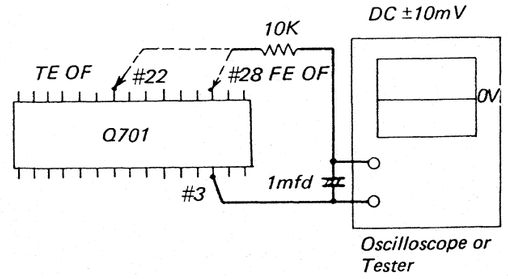


Figure 42

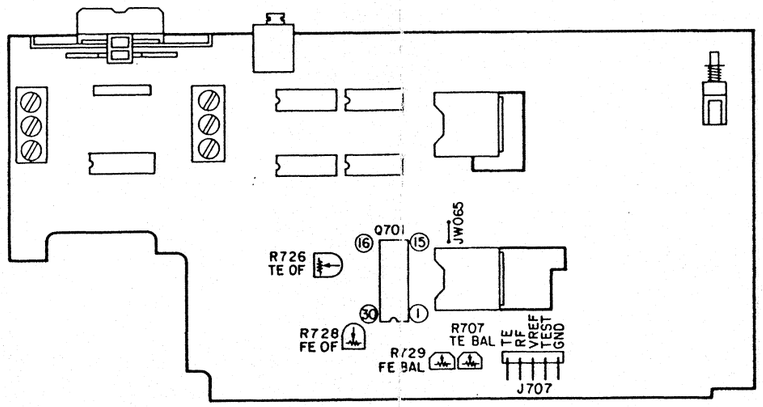


Figure 43

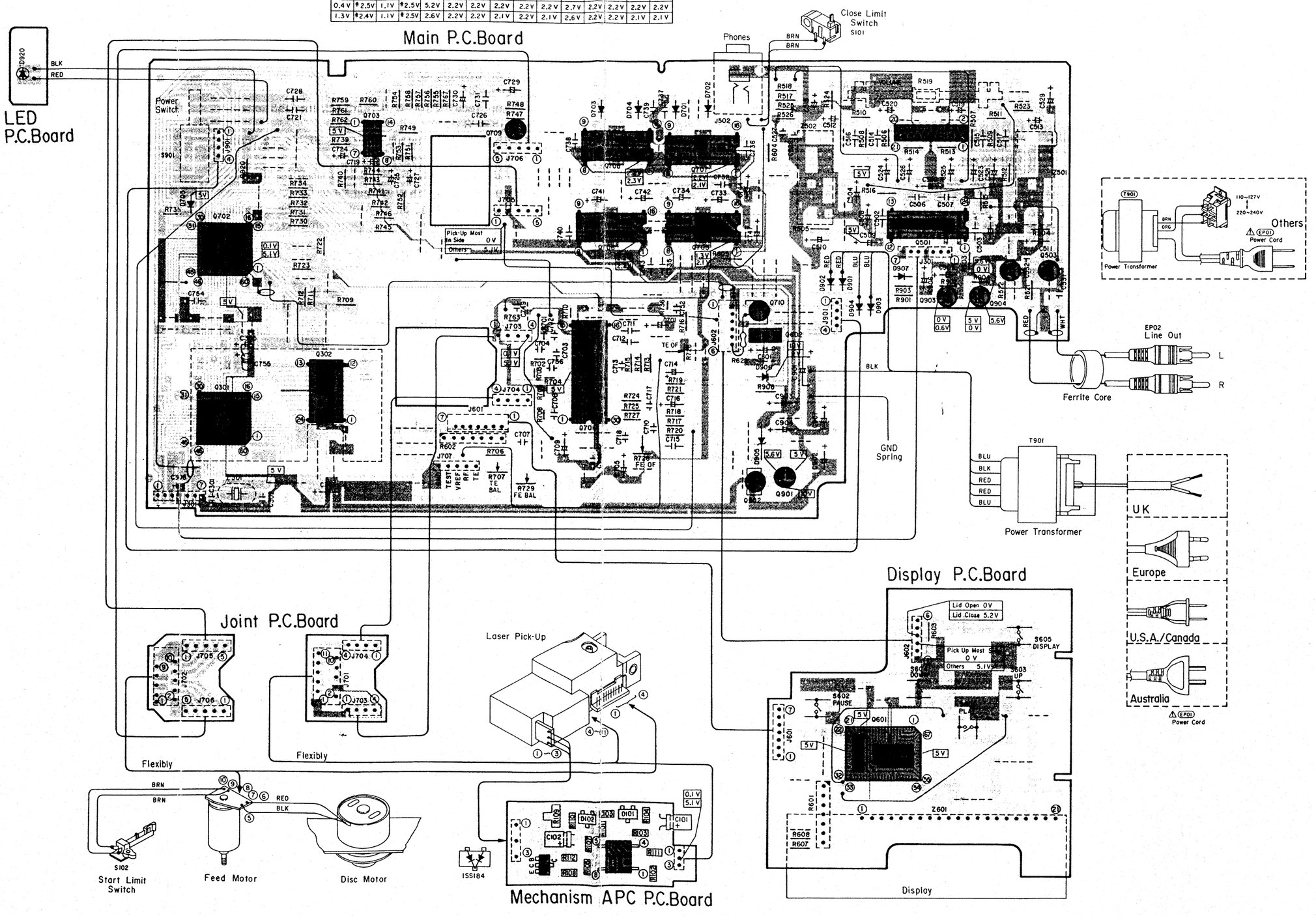
CAUTION: The necessary distance between laser pick-up and the viewers eye is only 2mm.

5. ELECTRICAL PARTS LOCATIONS

Q701 X DONT TOUCH

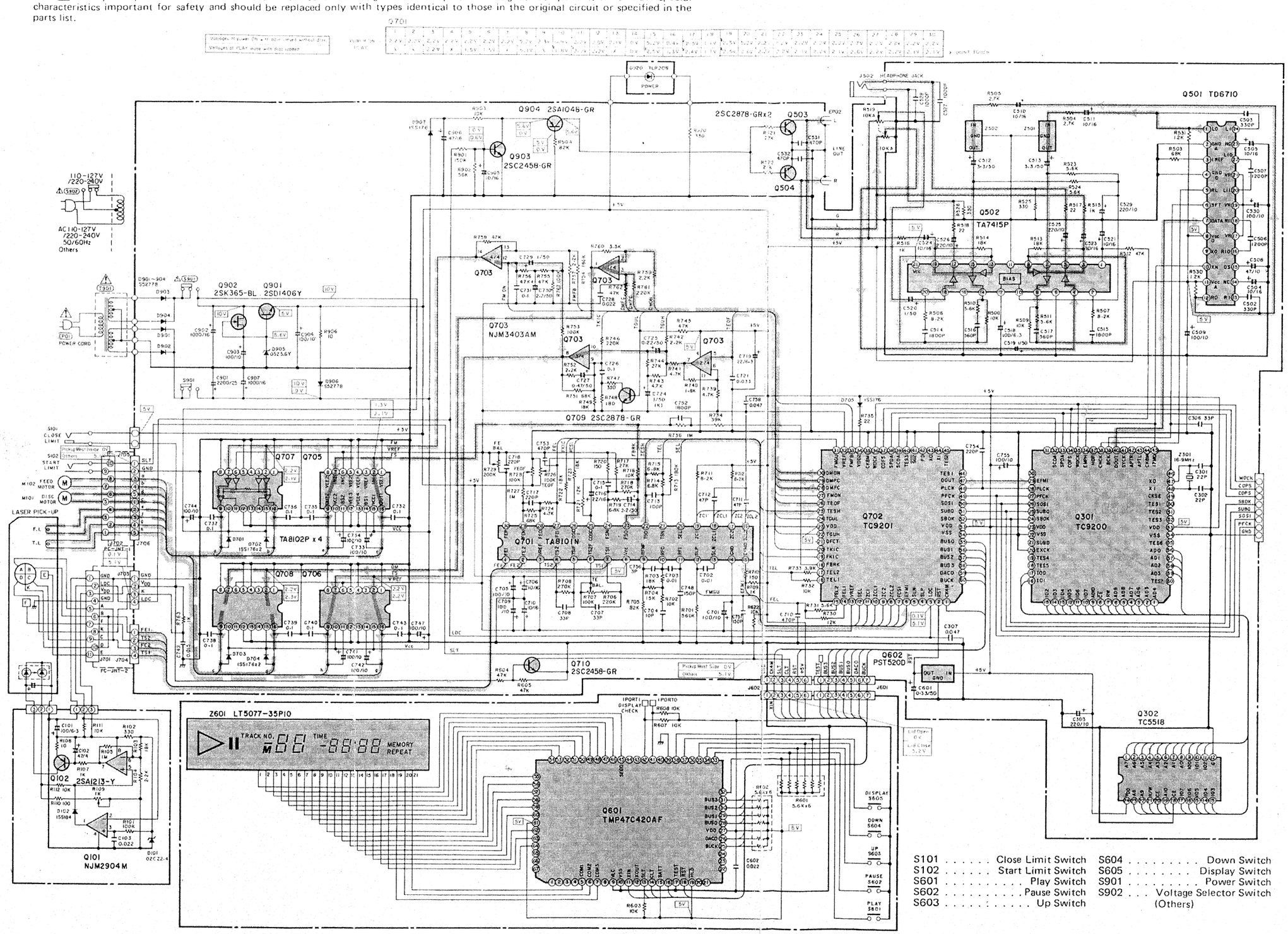
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
2.2 V	2.2V	2.2V	2.2V	2.2V	2.2V	2.2V	5.2V	2.3V	0.9 V	2.2V	2.0V	2.1V	0 V	5.2V	POWER ON
X	X	2.2V	X	1.5V	1.5V	X	5.1V	X	*1.8V	*2.2V	2.2V	X	0 V	*2.5V	PLAY
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
0.4 V	*2.5V	1.1V	*2.5V	5.2V	2.2V	2.2V	2.2V	2.2V	2.2V	2.7V	2.2V	2.2V	2.2V	2.2V	
1.3V	*2.4V	1.1V	*2.5V	2.6V	2.2V	2.2V	2.1V	2.2V	2.1V	2.6V	2.2V	2.2V	2.1V	2.1V	

Voltages at power ON with door closed without disc.
Voltages at PLAY mode with disc loaded.



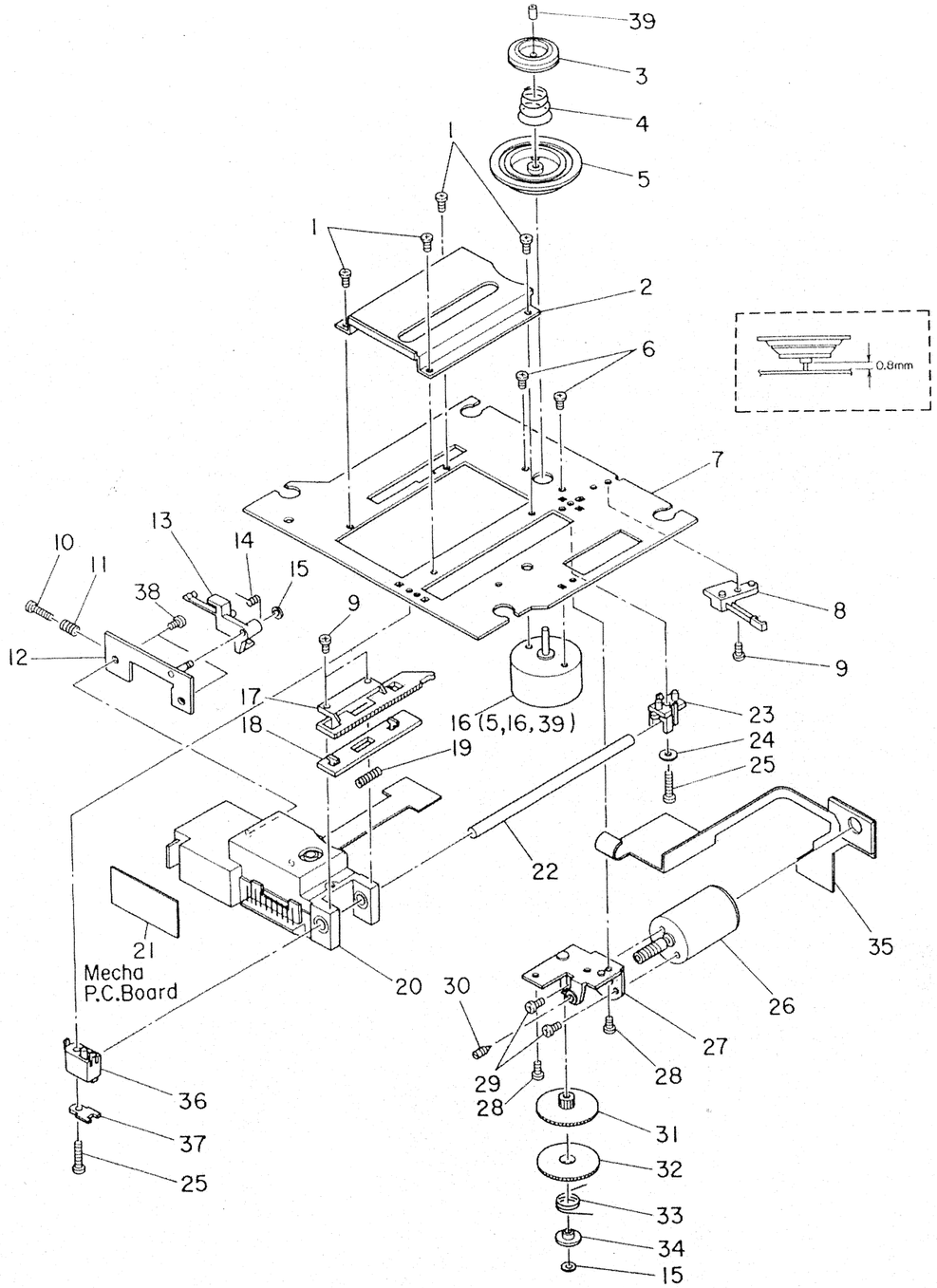
6. SCHEMATIC DIAGRAM

CAUTION:
The ⚠ mark, the symbol No. circled with oval in the schematic diagram and the parts list designate components which have special characteristics important for safety and should be replaced only with types identical to those in the original circuit or specified in the parts list.



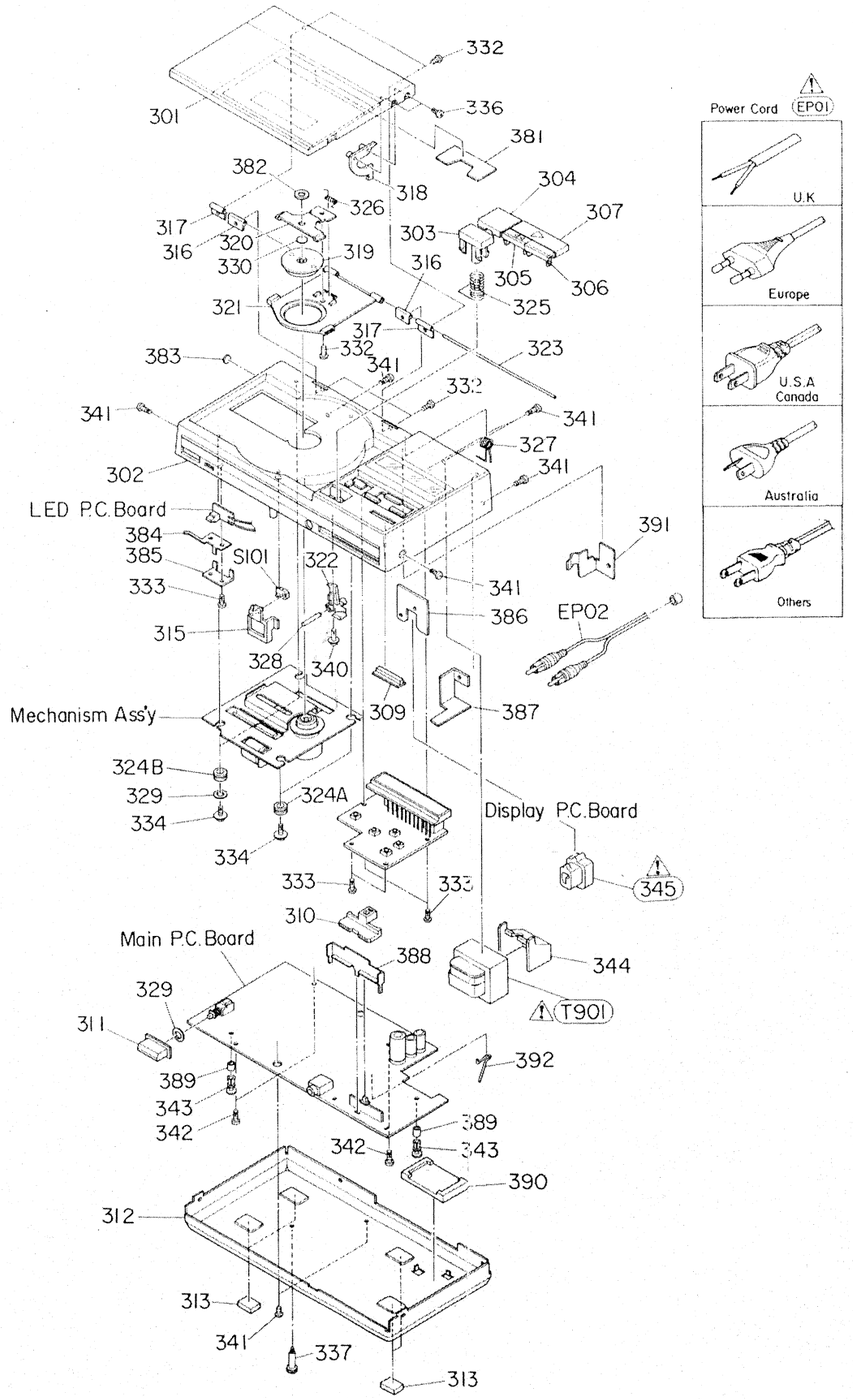
S101 . . . . . Close Limit Switch
S102 . . . . . Start Limit Switch
S601 . . . . . Play Switch
S602 . . . . . Pause Switch
S603 . . . . . Up Switch
S604 . . . . . Down Switch
S605 . . . . . Display Switch
S901 . . . . . Power Switch
S902 . . . Voltage Selector Switch (Others)

7. MECHANISM EXPLODED VIEW



NOTE: Parts excluded in the parts list are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

8. CABINET EXPLODED VIEW



NOTE: Parts excluded in the parts list are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

9. CABINET PARTS LIST

CAUTION:
The ⚠ mark, the symbol No. circled with oval in the schematic diagram and the parts list designate components which have special characteristics important for safety and should be replaced only with types identical to those in the original circuit or specified in the parts list.

Symbol No.	Part No.	Description
301	22825504	Disc Cover Ass'y
302	22825502	Mold Cabinet Ass'y (U.S.A., Canada, Europe, UK, Australia)
302	22825547	Mold Cabinet Ass'y (Others)
303	22884694	Knob, Open
304	22884690	Knob, Pause
305	22884692	Knob, Down
306	22884691	Knob, Up
307	22884689	Knob, Play
309	22884688	Knob, Display
310	22884693	Knob, Volume
311	22884687	Knob, Power
312	22719400	Bottom Plate (U.S.A., Canada)
312	22719386	Bottom Plate (Europe)
312	22719399	Bottom Plate (UK, Australia)
312	22719401	Bottom Plate (Others)
313	22766171	Foot, Cushion
315	20831575	Knob Holder, Power
316	20024312	Hinge
317	20024245	Hinge A
318	20748281	Cover Holder
319	20748312	Clamper Yoke Ass'y
320	20024190	Clamper Plate
321	20831565	Clamper Holder
322	20831913	Lock Cover
323	22764367	Hinge Shaft
324A	25761554	Cushion, Front
324B	25761544	Cushion, Back
325	25778361	Spring, Knob
326	25778344	Spring
327	25778376	Spring
328	22764366	Lock Shaft
329	20748315	Spacer
330	22753344	Spacer, Clamper
332	22708403	Screw, ϕ1.7 x 3mm, PAN, BLK
333	22708423	Screw, ϕ2 x 6mm, PAN Tap.
334	22708580	Screw, ϕ2 x 6mm, PAN Tap.
335	22707316	Screw, ϕ2 x 6mm, BID, BLK
337	22708679	Pick-up Screw
338	22907231	Caution Label, Screw
339	22707421	Screw, ϕ2 x 6mm
340	22707825	Screw, ϕ2.6 x 6mm, TPAN
341	22708606	Screw, ϕ2.6 x 8mm, BID Tap., BLK
342	22708265	Screw, ϕ2.6 x 8mm, BID Tap.

Symbol No.	Part No.	Description
343	22705030	Plastic Rivet, ϕ3 x 8mm
344	20844260	Transformer Cover
⚠ 345	25844322	Cord Bush
346	22707521	Screw, ϕ3 x 6mm, FLDT (Others)
347	22708731	Screw, ϕ2.6 x 6mm, BID Tap., BLK
361	22906499	Laser Label (Europe, UK, Australia, Others)
362	22906585	Caution Label (Europe)
363	22900619	Caution Label (U.S.A.)
363	22907154	Caution Label (UK)
363	22906500	Caution Label (Europe, Australia, Others)

10. MECHANISM PARTS LIST

Symbol No.	Part No.	Description
1	22708647	Screw, ϕ2 x 1.5mm, PAN
2	20778205	Pick-up Cover
3	20727181	Center Ring
4	25777528	Spring, Center Ring
5	20723156	Disc Table
6	22707725	Screw, ϕ1.7 x 2.5mm, PAN
8	22196068	Leaf Switch (S102)
9	22708524	Screw, ϕ2 x 4mm, BID
10	22708576	Screw, ϕ2 x 10mm, BID
11	25777137	Spring, Azimuth
13	20754258	Adjust Lever, Pick-up
14	25778347	Spring, Adjust Lever
15	20776135	Washer, ϕ2.1
16	25792071	Disc Motor Ass'y
17	20727155	Rack Gear A
18	20727156	Rack Gear B
19	25777529	Spring, Rack
20	25111050	Laser Pick-up Kit
22	20764264	Guide Shaft
23	20748299	Shaft Holder B
24	22708560	Washer, ϕ2
25	22708577	Screw, ϕ2 x 12mm, BID
26	25792070	Drive Motor Ass'y
28	22708523	Screw, ϕ2 x 3mm, BID
29	22707579	Screw, ϕ2 x 3mm, PAN
30	20776149	Thrust Screw
31	20727168	Gear B
32	20727167	Gear A
33	25778346	Spring, Gear
34	25754331	Boss
35	22192931	Flexible P.C. Board
36	20748300	Shaft Holder A
37	25766050	Washer, ϕ1.6
38	22708529	Screw, ϕ2.6 x 4mm, BID
39	20764287	Center Ring Cap

Symbol No.	Part No.	Description

11. PARTS LIST

CAUTION:
The ⚠ mark, the symbol No. circled with oval in the schematic diagram and the parts list designate components which have special characteristics important for safety and should be replaced only with types identical to those in the original circuit or specified in the parts list.

Symbol No.	Part No.	Description
IC'S, TRANSISTORS & DIODES		
Q101	22117697	IC, NJM2904M
Q102	A6543610	Transistor, 2SA1213-Y
Q301	B0412001	IC, TC9200F-BS
Q302	B0483585	IC, TC5518BFL-20 (T)
Q501	B0272750	IC, TD6710N
Q502	B0326190	IC, TA7415P
Q503, 504	A6342210	Transistor, 2SC2878-B
Q601	22117787	IC, TMP47C420AF8663Z
Q602	22117550	IC, PST520D
Q701	B0377580	IC, TA8101N
Q702	B0412011	IC, TC9201F-BS
Q703	22117700	IC, NJM3403AM
Q705, 706	B0377590	IC, TA8102P
Q707, 708	B0377590	IC, TA8102P
Q709	A6342210	Transistor, 2SC2878-B
Q710	A6332440	Transistor, 2SC2458-GR
Q901	A6868020	Transistor, 2SD1406-Y
Q902	A6058730	Transistor, 2SK365-BL
Q903	A6332440	Transistor, 2SC2458-GR
Q904	A6534440	Transistor, 2SA1048-GR
D101	A7238080	Diode, 02CZ2.4, Zener
D102	A7160570	Diode, 1SS176
D701, 702	A7160570	Diode, 1SS176
D703, 704	A7160570	Diode, 1SS176
D705	A7160570	Diode, 1SS176
⚠ D901, 902	A7978380	Diode, S5277B
⚠ D903, 904	A7580250	Diode, 1GW42
D905	A7110017	Diode, 05Z5.6-Y, Zener
D906	A7978380	Diode, S5277B
D907	A7160570	Diode, 1SS176
D920	A8603140	Diode, TLR208, LED RED

Symbol No.	Part No.	Description
ELECTRICAL PARTS		
⚠ T901	22224593	Power Transformer (U.S.A.)
⚠ T901	22224804	Power Transformer (Canada)
⚠ T901	22224603	Power Transformer (Europe)
⚠ T901	22224804	Power Transformer (UK)
⚠ T901	22224605	Power Transformer (Australia)
⚠ T901	22224629	Power Transformer (Others)
S101	22196713	Push Switch, Close Limit
S102	22196068	Leaf Switch, Start Limit
S601, 602	22196601	Key Switch, Play/Pause
S603, 604	22196601	Key Switch, Up/Down
S605	22196601	Key Switch, Display
⚠ S901	22196761	Push Switch, Power
⚠ S902	22196111	Voltage Selector Switch (Others)
J502	22198172	Jack, ϕ3.5, Headphone
Z301	22153382	Crystal OSC, 16.9 MHz
Z501, 502	22137776	Low-pass Filter, LC-7
Z601	22104643	LCD, LT5077-35P10
⚠ EP01	22176574	Power Cord (U.S.A., Canada)
⚠ EP01	22176642	Power Cord (Europe)
⚠ EP01	22176628	Power Cord (UK)
⚠ EP01	22176588	Power Cord (Australia)
⚠ EP01	22176680	Power Cord (Others)
EP02	22170627	Pin Cord
CAPACITORS		
D = ±0.5pF, J = ±5%, K = ±10%, M = ±20%, Z = −20+80%		
ABBREVIATIONS: EL = Electrolytic, CD = Ceramic Disk, TT = Tantalum, PP = Polypropylene, MY = Mylar, BL = Barrier Layer		
C101	22440454	EL, 100mfd, 6.3V
C102	22440652	EL, 47mfd, 4V
C103	22312223	CH, 0.022mfd, 50V, Z
C301, 302	22361220	CD, 22pF, 50V, J
C303	22483221	EL, 220mfd, 10V
C306	22361330	CD, 33pF, 50V, J
C307	22360484	CD, 0.047mfd, 50V, Z
C502, 503	22321049	PP, 330pF, 50V, J
C504	22485100	EL, 10mfd, 16V
C505	22485100	EL, 10mfd, 16V
C506, 507	22321058	PP, 1200pF, 50V, J

Symbol No.	Part No.	Description
C508	22485470	EL, 47mfd, 16V
C509	22483101	EL, 100mfd, 10V
C510, 511	22485100	EL, 10mfd, 16V
C512, 513	22440557	EL, 3.3mfd, 50V
C514, 515	22321060	PP, 1800pF, 50V, J
C516, 517	22321054	PP, 560pF, 50V, J
C518	22440399	EL, 100mfd, 6.3V
C519, 520	22440554	EL, 1mfd, 50V
C521	22485100	EL, 10mfd, 16V
C523, 524	22485100	EL, 10mfd, 16V
C525, 526	22483221	EL, 220mfd, 10V
C527, 528	22349102	CD, 1000pF, 50V, K
C529	22483221	EL, 220mfd, 10V
C530	22483101	EL, 100mfd, 10V
C531, 532	22349471	CD, 470pF, 50V, K
C601	22480006	EL, 0.33mfd, 50V
C602	22342223	CD, 0.022mfd, 50V, Z
C701	22483101	EL, 100mfd, 10V
C702, 703	22360616	BL, 0.01mfd, 25V, K
C704	22361100	CD, 10pF, 50V, D
C705	22483101	EL, 100mfd, 10V (U.S.A., Canada, Europe, U.K., Australia)
C705	22440454	EL, 100mfd, 6.3V (Others)
C706	22490189	TT, 10mfd, 10V
C707, 708	22361330	CD, 33pF, 50V, J
C709	22483101	EL, 100mfd, 10V
C710	22490189	TT, 10mfd, 10V
C711, 712	22361470	CD, 47pF, 50V, J
C713	22362101	CD, 100pF, 50V, K
C714	22488229	EL, 2.2mfd, 50V, (U.S.A., Canada, Europe, U.K., Australia)
C714	22440556	EL, 2.2mfd, 50V, (Others)
C715	22371104	MY, 0.1mfd, 50V, J
C716	22485220	EL, 22mfd, 16V (U.S.A., Canada, Europe, U.K., Australia)
C716	22440445	EL, 22mfd, 16V (Others)
C717, 718	22349221	CD, 220pF, 50V, K
C719	22440562	EL, 22mfd, 6.3V
C721	22360635	BL, 0.033mfd, 25V, K
C724	22440554	EL, 1mfd, 50V
C725	22440550	EL, 22mfd, 50V
C726	22371104	MY, 0.1mfd, 50V, J
C727	22440552	EL, 0.47mfd, 50V
C728	22360633	BL, 0.022mfd, 25V, K
C729	22488109	EL, 1mfd, 50V
C730	22440556	EL, 2.2mfd, 50V
C731	22371104	MY, 0.1mfd, 50V, J
C732	22360333	BL, 0.1mfd, 25V, M
C733, 734	22483101	EL, 100mfd, 10V
C735, 736	22360333	BL, 0.1mfd, 25V, M
C737, 738	22360333	BL, 0.1mfd, 25V, M
C739, 740	22360333	BL, 0.1mfd, 25V, M
C741, 742	22483101	EL, 100mfd, 10V
C743	22360333	BL, 0.1mfd, 25V, M
C744	22483101	EL, 100mfd, 10V
C747	22483101	EL, 100mfd, 10V
C748	22349151	CD, 150pF, 50V, K
C749	22360631	BL, 0.015mfd, 25V, K
C752	22360623	BL, 1800pF, 25V, K
C753	22349471	CD, 470pF, 50V, K
C754	22340213	CD, 220pF, 50V, K
C755	22483101	EL, 100mfd, 10V
C756	22361309	CD, 3pF, 50V, D
C757	22349151	CD, 150pF, 50V, K
C758	22360484	CD, 0.047mfd, 50V, Z
C901	22486222	EL, 2200mfd, 25V
C902	22485102	EL, 1000mfd, 16V
C903	22483101	EL, 100mfd, 10V
C904	22483221	EL, 220mfd, 10V
C905	22485100	EL, 10mfd, 16V
C906	22485470	EL, 47mfd, 16V
C907	22485102	EL, 1000mfd, 16V

RESISTORS

All resistor are carbon film, 1/6W, ±5% unless otherwise noted. 1K ohm = 1000 ohm, 1M ohm = 1000K ohm

R101	22521104	100K ohm, 1/10W, Chip
R102	22521331	330 ohm, 1/10W, Chip
R103	22521183	18K ohm, 1/10W, Chip
R104	22521222	2.2K ohm, 1/10W, Chip
R105	22521105	1M ohm, 1/10W, Chip
R107	22521102	1K ohm, 1/10W, Chip
R108	22521100	10 ohm, 1/10W, Chip
R109	22658887	1K ohm, B, Semi-fixed Variable
R110	22521101	100 ohm, 1/10W, Chip
R111, 112	22521103	10K ohm, 1/10W, Chip
R503	22557683	68K ohm
R504, 505	22584272	2.7K ohm
R506, 507	22584822	8.2K ohm
R508, 509	22584103	10K ohm
R510, 511	22584562	5.6K ohm
R512	22584473	47K ohm
R513, 514	22584183	18K ohm
R515, 516	22584102	1K ohm
R517, 518	22584220	22 ohm
R519	22657413	10K ohm, A, Variable, Volume
R521, 522	22584273	27K ohm
R523, 524	22584562	5.6K ohm
R525, 526	22584331	330 ohm
R530, 531	22557122	1.2K ohm

Symbol No.	Part No.	Description
R601, 602	22540781	Composite Part, 5.6K x 6
R603	22584103	10K ohm
R604, 605	22584473	47K ohm
R607, 608	22584103	10K ohm
R622	22584103	10K ohm
R701	22557564	560K ohm
R702	22557103	10K ohm
R703	22557183	18K ohm
R704	22557153	15K ohm
R705	22557823	82K ohm
R706	22584224	220K ohm
R707	22658858	100K ohm, B, Semi-fixed Variable
R708	22557274	270K ohm
R709	22584102	1K ohm
R710	22557151	150 ohm
R711, 712	22584822	8.2K ohm
R713	22584184	180K ohm
R716	22584103	10K ohm
R717	22584273	27K ohm
R718	22584274	270K ohm
R719	22584682	6.8K ohm
R720	22584151	150 ohm
R721	22584123	12K ohm
R722, 723	22584183	18K ohm
R724	22584472	4.7K ohm
R725	22584683	68K ohm
R726	22658765	100K ohm, B, Semi-fixed Variable
R727	22584105	1M ohm
R728	22658765	100K ohm, B, Semi-fixed Variable
R729	22658859	200K ohm, B, Semi-fixed Variable
R730	22584123	12K ohm
R731	22584562	5.6K ohm
R732	22584103	10K ohm
R733	22584392	3.9K ohm
R734	22584393	39K ohm
R735	22584220	22 ohm
R736	22557105	1M ohm
R739	22584472	4.7K ohm
R740	22584182	1.8K ohm
R741	22584472	4.7K ohm
R742	22584222	2.2K ohm
R743	22584472	4.7K ohm
R744	22584273	27K ohm
R745	22584473	47K ohm
R746	22584224	220K ohm
R747	22584331	330 ohm
R748	22584181	180 ohm
R749	22584183	18K ohm

Symbol No.	Part No.	Description
R751	22584683	68K ohm
R752	22584222	2.2K ohm
R753	22584104	100K ohm
R755, 756	22584473	47K ohm
R757	22584222	2.2K ohm
R758	22584473	47K ohm
R759	22584222	2.2K ohm
R760	22584332	3.3K ohm
R761	22584224	220K ohm
R762	22584473	47K ohm
R763	22584102	1K ohm
R764	22584184	180K ohm
R767	22584104	100K ohm
R901	22584154	150K ohm
R902	22584563	56K ohm
R903	22584103	10K ohm
R904	22584823	82K ohm
R906	22584100	10 ohm
R920	22584331	330 ohm

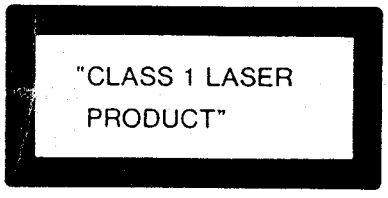
ACCESSORIES

AC01	22908089	Owner's Manual (U.S.A.)
AC01	22908090	Owner's Manual (Canada)
AC01	22908091	Owner's Manual (Europe)
AC01	22908092	Owner's Manual (UK, Australia)
AC01	22908093	Owner's Manual (Others)

12. CAUTION LABELS

CAUTION
USE OF CONTROLS OR ADJUSTMENTS OR PERFORMANCE OF PROCEDURES OTHER THAN THOSE SPECIFIED HEREIN MAY RESULT IN HAZARDOUS RADIATION EXPOSURE.

OBS! Apparaten innehåller laserkomponent som avger laserstrålning överstigande gränsen för laserklass 1.



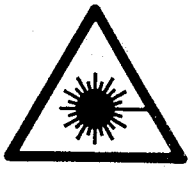
ADVARSEL

Denne mærkning er anbragt udvendigt på apparatet og indikerer, at appapatet arbejder med laserstråler af klasse 1, hvilket betyder, at der anvendes laserstråler at svageste klasse, og at man ikke på apparatets yderside kan blive udsat for utilladelig kraftig stråling.

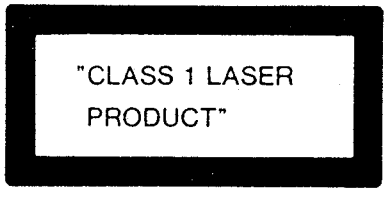
APPARATET BOR KUN ÅBNES AF FAGFOLK MED SAERLIGT KENDSKAB TIL APPARATER MED LASERSTRÅLER!

Indvendigt i apparatet er anbragt den her gengivne advarselsmærkning, som advarer imod at foretage sådanne indgreb i apparatet, at man kan komme til at udsætte sig for laserstråling.

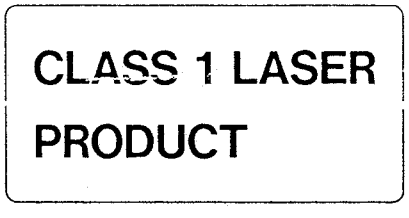
Varoitus: Laite sisältää laserdiodin, joka lähettää näkymätöntä silmille vaarallista lasersäteilyä.



CAUTION: This equipment contains a laser diode which causes invisible laser radiation, which is dangerous to eyes.
Inside of the equipment, there is a warning marking of laser radiation.



CAUTION: This model is classified as a "CLASS I LASER PRODUCT".



RADIO INTERFERENCE REGULATIONS

THIS APPARATUS HAS BEEN PRODUCED TO COMPLY WITH "DIRECTIVE NO. 82/499/EEC".